

REMARKS

1. Status of the Application

Claims 1–11 were originally pending in the application. None of the claims were cancelled, and thus, claims 1–11 remain at issue in the current application.

2. Rejection of the Claims in view of Leir et al.

Claims 1–11 stand rejected under 35 U.S.C. §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 5,576,356 to Leir et al. In order for a reference to act as a §102 bar to patentability, the reference must teach each and every element of the claimed invention. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771 (Fed. Cir. 1983). Without the required teaching of “each and every element” as set forth in the claims, it is improper to maintain such rejections under §102(b). Leir et al. do not teach each and every element of the claimed invention, and thus fails as an anticipatory reference. Similarly, Applicants’ invention is also not obvious in view of Leir et al.

The present invention is directed to release liners. In the invention, a radiation curable silicone release agent is dispersed in an organic solvent and then applied onto the surface of a substrate. Dispersion of the silicone release agent in an organic solvent provides for smoother surfaces, better uniform coating and better adhesion of the release agent. The coated substrate is exposed to active conditions sufficient to remove the solvent, e.g., heating optionally in the presence of high velocity air. The substrate is then exposed to radiation to cure the silicone release agent. The result is a release liner having significantly reduced amounts of undesirable components, such as reduced total silicone extractables (measured as micrograms/square cm) and/or volatile silicone compounds (measured in ppm). Preferably, the release liners of the invention have no more than about 10 parts per million and more preferably less than about 2.0ppm of volatile silicone compounds in the cured product (see specification at p. 2). This release liner, having the specified properties is not taught or suggested by Leir et al.

Although not wishing to be bound by any explanation of the invention, Applicants believe that treating the coated substrate with heat and/or high velocity air not only drives off the solvent, but also provides molecular agitation of the compositions. As a result, volatile silicone compounds, which are present in such compositions, can be driven off as well, thereby reducing the amounts of such compounds in the cured product. Reduced amounts of total extractables and/or volatile

silicone compounds in the cured release layer results in a product exhibiting minimal or substantially no silicone transfer to adjacent surfaces. In turn, such release liners of the present invention have better adhesive properties of adjacent adhesive layers, fewer printing problems on face stock, and minimal or no silicone migration in microelectronic applications. Leir et al. also do not teach or suggest these aspects of Applicants' invention.

Comparison of Applicants' invention to that of a "conventional" release liner prepared without solvent and without a heating step are provided, wherein "[s]amples of release liners of the invention and conventional UV cured silicone based release liners were analyzed for volatiles content by outgassing as described above." From a simple comparison of the results, it is clear that Applicants' invention, Samples C and D, have a much lower level (in fact one-tenth of the amount) of siloxanes, or outgassing components (57 nanograms/square centimeter and 32 nanograms/square centimeter, respectively), than the "conventional UV curable release liner prepared without solvent and cured without a heating step," having a much higher siloxane reading of 474 nanograms/square centimeter. Applicants respectfully submit that it is the heating step that leads to the lower levels of extractables in their resulting product, and the examples demonstrate this fact.

Leir et al. describe a radiation cured silicone release coating from solutions of relatively low levels of a polyorganosiloxane substituted with small amounts of reactive functional groups dissolved in a co-reactive monomer or mixture of monomers and containing a photoactive catalyst (col. 4, lines 25-29). Leir et al. prepare their coating with solvent but without heating. As such, Leir et al. specifically state that one of the advantages of their invention is that "a need exists for rapidly curing silicone coating which can be rapidly and completely **cured in air**" (emphasis added) (col. 4, lines 4-5). Also in column 9, lines 43 to 45, Leir et al. teach that drying air should be "less than the boiling point of the constituents thereof." Many of the components in Leir et al. are monomeric in nature and would boil at relatively low temperatures. The desire and design is for those components to remain in the coating as they are functional and should react into the polymer matrix. However chemical reactions are always incomplete, and any of the monomers left unreacted would be undesired volatiles.

Applicants disagree that "all of the advantages of applying the composition in a solvent, as argued by Applicants, will be inherently found in the composition of Leir et al." (Office Action, p.2). Applicants specifically teach the use of heat and optionally high velocity air sufficient to remove all of the solvent, resulting in a product with reduced amounts of total extractables and/or

volatile organic compounds. This fact is demonstrated in Applicants' Examples and discussed above. There is absolutely no teaching in Leir et al. of the use of heat and optionally high velocity air to **drive off** the solvent, nor is there any teaching of measuring the reduction in total extractables and/or volatile organic compounds. It is acknowledged in the Office Action that “[t]he solvent [of Leir et al.] is then allowed to evaporate prior to UV cure.” (Office Action, p. 2). In the Office Action it is stated that “patentees teach that the solvent is evaporated, the benefits of having the solvent driven off, as argued by applicants, will also be expected.” However, Applicants respectfully submit that it is the difference in this process, “passive evaporation” of solvent, as taught in Leir et al., versus “actively driving off” the solvent as taught and claimed by Applicants, that results in a product having the desired reduction of total extractables and/or volatile silicone compounds in the cured release liner of Applicants’ invention. As explained above, it is the act of “actively driving off” of solvent that Applicants believe results in a product having the reduction in total extractables and/or volatile silicone compounds found in Applicants’ product.

Further, it is stated in the Office Action that the working examples of Leir et al., show solvent systems that are heated after UV curing. However, Applicants submit that the alleged heating step of Leir et al., is done as part of the release force test protocol, after the liner is laminated to the tape. This is not the same process as applying heat and optionally high velocity air prior to UV curing to reduce the amount of undesirable total silicone extractables, as in Applicants’ invention.

Applicants submit that these key differences between the processes of the patentee and Applicants do not inherently lead to products having the same properties:

“To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999).

Applicants respectfully submit that the Examiner has misapplied the concept of “inherency” in view of the Leir et al. reference. Further, “[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Int'l 1990). As discussed above, there are significant differences between the Applicants’ process and that of Leir

et al., which results in the coating comprising no more than about 1.5 micrograms per square centimeter total silicone extractables. The fact that Applicants actively drive off solvent using heat, and optionally high velocity air, is what Applicants believe results in a product having low levels of extractables. The missing elements of extremely low levels of extractables is *not necessarily* present in Leir et al., with this assertion being supported in the fact that there is no teaching or suggestion of this kind in Leir et al. Therefore, the application of inherency is erroneous.

Statements are made in the Office Action that Leir et al., teaches “solventless” silicone compositions applied in combination with a “reactive diluent” referring to Example 33, which is “in effect, an organic solvent.” Further, it is submitted that because heating is used in this process, the benefits described in Applicants’ invention will be met. Applicants submit, however, Leir et al. actually *teach away* from that assumption. In describing the reactive diluents, Leir et al. define them as “those which undergo cationic co-polymerization with the epoxy functional or other reactive functional silicone fluids described above, and having a sufficiently high boiling point above about 100°C, preferably above 150°C, so as not to evaporate from the substrate before curing.” (col. 7, lines 13-18). In addition, Leir et al. states “[i]f heating is utilized, the temperature can range from about room temperature (22°C) to a temperature less than the boiling point of the composition or constituents thereof. . . .” (col. 9, lines 38-41). The intent is that the reactive diluent will in fact react with the polymer network, and not boil off during the coating process. Therefore, Applicants submit that the heating benefits of their invention, and thus the resulting product, is not met by the solventless systems of Leir et al.

The Examiner alleges that because the same process steps are used in Leir et al. as in Applicants’ invention, the resulting products inherently have the same properties. However, Applicants have demonstrated that both its composition and process steps are different from that of Leir et al. resulting in a product different from that of Leir et al. Thus, it does not follow that the distinct differences in the two compositions would lead to a finding of inherency or obviousness between the release liners of Leir et al. and Applicants. Applicants respectfully request that the rejection under §102(b) or alternatively, under §103(a) be withdrawn with respect to Claims 1-11

Conclusion

In view of the arguments presented above, Applicants respectfully submit that Claims 1-11 are now in condition for allowance, and such action is respectfully requested.

Respectfully submitted,

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